

REMARKS

Claims 1, 3, 4, 6 and 7, all the claims pending in the application, are rejected. Claim 1 is amended. New claim 9 is added.

Amended Claims

Amended claim 1 and new claim 9 are clearly supported by the description of page 9, lines 16-25 of the original specification.

Claim Rejections - 35 USC § 103

Claims 1, 3, 4, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aratani (US 4,671,814) in view of Takahashi (US 6,119,483) and Morehouse (US 5,379,171). This rejection is traversed for at least the following reasons.

Amended Claim 1

According to the present invention recited in amended claim 1, the surface of the glass substrate is mirror-polished ***prior to the chemical strengthening process***. Thus, the glass substrate having uniform composition in a disk thickness-direction is subjected to the chemical strengthening process because the surface of the glass substrate is mirror-polished in advance.

Aratani

No Uniform Composition in Aratani

By contrast, Aratani is directed to a float glass produced by the float process and having “the tin-containing surface layer” as described at col. 1, lines 6-8 and col. 2, lines 15-20. Thus, in Aratani, the float glass having a “tin-containing surface layer” is subjected to the chemical strengthening process. Such float glass, having a “tin-containing surface layer,” does not provide a uniform composition in the disk thickness-direction.

Accordingly, the glass that is subjected to a chemical strengthening process in Aratani is clearly different from the glass in the present invention.

Uniform Composition in Invention

With respect to the glass substrate of the present invention, if the glass substrate is produced by a press molding process, the glass substrate has a uniform composition in the disk

thickness-direction. On the other hand, even if the glass substrate is produced by a float process, “the tin-containing surface layer” is removed by the mirror-polishing process prior to the chemical strengthening process according to the present invention.

Object of Processes Differ

Furthermore, the object of Aratani is to prevent occurrence of a warp in the float glass having “the tin-containing surface layer”.

By contrast, the object of the present invention is to provide a glass substrate manufacturing method that provides a high in transverse strength and prevents damage or breakage with time for the glass substrate having uniform composition in a disk thickness-direction and is free from a “tin-containing surface layer.” According to the present invention, since the “tin-containing surface layer” is inevitably removed by the mirror-polishing process *prior to* the chemical strengthening process, the object of Aratani has been solved already. Thus, the present invention is clearly different from Aratani in object.

As discussed above, the present invention is clearly patentable over the cited references because the present invention is different from Aratani in (1) material of the glass substrate and (2) object of the process.

Takahashi

In framing the rejection, the Examiner observes that “Takahashi discloses a closely related method for chemically strengthening a glass substrate by immersion in molten sodium and potassium nitrate salts wherein said strengthened substrate may be employed for use as a magnetic disk substrate.”

The Examiner asserts that the claimed “ion exchange process would follow naturally from treating the Takahashi glass substrate by the Aratani disclosed two step ion exchange process.”

However, Takahashi does not use a mirror-polishing process *prior to* the chemical strengthening process, nor does it provide any suggestion or motivation to use a mirror polishing process prior to a chemical strengthening process. More importantly, it does not teach any reason to modify Aratani in a manner that would lead to the present invention.

Morehouse

The Examiner cites Morehouse et. al. for a teaching of “the detailed construction of a magnetic hard drive device”, particularly, the outer diameter and thickness of the disk, as taught at column 43, lines 35-47.

However, Morehouse does not remedy the deficiencies of Aratani and Takahashi in that it does not teach how or why one of ordinary skill in the art would use a mirror-polishing process *prior to* the chemical strengthening process.

Claims 3, 4, 6 and 7

These claims would be patentable due to their dependence from amended claim 1.

Claim 9

This new claim depends from amended claim 1 and would be patentable for the reasons given for its parent claim.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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